

Remarks

Claims 31-57 are pending in this application, with claims 31, 32, 44 and 57 having been amended, claim 38 having been rewritten in independent form, and claims 1-30 having been previously cancelled. Reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks. No new matter has been added.

Claim Rejections under 35 U.S.C. § 103

Claims 31-34 and 39-43 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,616,067 to Goenka (“Goenka”). Applicant traverses this rejection on the basis that claims 31-34 and 39-43 recite subject matter neither disclosed nor suggested by Goenka.

Independent claim 31 has been amended to explicitly recite that “the liquid CO₂ is transformed into dry snow in the expansion volume (34) apart from the carrier gas in the blasting line (10)” and that “the dry snow is introduced from the expansion volume (34) into the blasting line (10)”. By transforming the liquid CO₂ into snow in the expansion volume apart from the carrier gas, the present invention makes it possible to produce sufficient amounts of dry snow having the correct composition to achieve high blasting powers and high cleaning effects that were not possible with prior blasting cleaners. While Goenka is directed to a CO₂ blasting cleaner, the dry snow in Goenka is formed in the carrier gas. Goenka fails to teach or suggest transforming the liquid CO₂ into dry snow in an expansion chamber apart from the carrier gas in a blasting line. Thus, the cited art fails to teach or suggest each and every element of claim 31. Applicant, therefore, respectfully requests the withdrawal of the rejection of claim 31, as well as the rejection of claims 32-34 and 39-43, which depend from claim 31.

Claims 35 and 36 were rejected under 35 U.S.C. § 103 as being unpatentable over Goenka in view of U.S. Patent No. 5,184,427 to Armstrong (“Armstrong”). Applicant traverses this rejection on the basis that claims 35 and 36 recite subject matter that neither of Goenka nor Armstrong discloses. More specifically, claims 35 and 36 each depend from independent claim 31 which, as noted above, calls for the liquid CO₂ to be transformed into dry snow in the expansion volume (34) apart from the carrier gas in the blasting line (10) and that the dry snow is introduced from the expansion volume (34) into the blasting line (10). In the very least, Goenka fails to teach or suggest transforming the liquid CO₂ into dry snow in an expansion chamber apart from the carrier gas in a blasting line. Armstrong fails to remedy the deficiencies of Goenka. Instead, Armstrong discloses feeding solid dry ice pellets from a hopper through a rigid or flexible hose into a blast unit and into a blast gun. Armstrong does not disclose transformation of liquid CO₂ into dry snow in an expansion chamber apart from the carrier gas in a blasting line. Therefore, for at least this reason, the proposed combination of Goenka and Armstrong would not result in the invention set forth in claims 35 and 36. Applicant, therefore, respectfully requests the withdrawal of the rejection of claims 35 and 36.

Claim 37 was rejected under 35 U.S.C. § 103 as being unpatentable over Goenka in view of U.S. Patent No. 5,785,581 to Settles (“Settles”). Applicant traverses this rejection on the basis that claim 37 recites subject matter that neither Goenka nor Settles discloses. More specifically, claim 37 depends from independent claim 31 which, as noted above, calls for the liquid CO₂ to be transformed into dry snow in the expansion volume (34) apart from the carrier gas in the blasting line (10) and that the dry snow is introduced from the expansion volume (34) into the

blasting line (10). In the very least, Goenka fails to teach or suggest transforming the liquid CO₂ into dry snow in an expansion chamber apart from the carrier gas in a blasting line. Settles fails to remedy the deficiencies of Goenka. Instead, Settles discloses using a pressure-swirl atomizer to break up liquid due to the combined action of liquid instability and aerodynamic forces and then exposing fine water droplets to cold gas to form ice crystals in the blasting line just prior to the blast nozzle. Thus, the apparatus and method of Settles does not teach or suggest transformation of liquid CO₂ into dry snow in an expansion chamber apart from the carrier gas in a blasting line. Therefore, for at least this reason, the proposed combination of Goenka and Settles would not result in the invention set forth in claim 37. Applicant, therefore, respectfully requests the withdrawal of the rejection of claim 37.

Claims 44-57 were rejected under 35 U.S.C. §103 as unpatentable over Goenka in view of Settles. Applicants traverse this rejection on the basis that claims 44-57 recite subject matter that neither Goenka nor Settles discloses.

Claim 44, as amended, recites an apparatus for cleaning surfaces in which “liquid CO₂ is transformed into dry snow in the expansion volume (34) apart from the carrier gas in the blasting line (10), and wherein the blasting nozzle (14) is connected to the downstream end of the blasting line (10)”. As stated above, Goenka fails to teach or suggest transformation of liquid CO₂ into dry snow in an expansion chamber apart from the carrier gas in a blasting line, and Settles fails to correct this deficiency. Instead, Settles discloses exposing fine water droplets to cold gas to form ice crystals in the blasting line just prior to the blast nozzle. Thus, the apparatus and method of Settles does not teach or suggest transformation of liquid CO₂ into dry snow in an expansion

chamber apart from the carrier gas in a blasting line. Accordingly, the proposed combination of Goenka and Settles would not include all of the elements of claim 44. Applicants therefore respectfully request withdrawal of the rejection of claim 44, as well as the rejection of claims 45-57, which depend from claim 44.

Claim Objection

The Office has objected to claim 38 as being dependent upon a rejected base claim. Applicant appreciates the indication of allowable subject matter in claim 38 and has rewritten the claim in independent form. Accordingly, claim 38 should now be in condition for allowance.

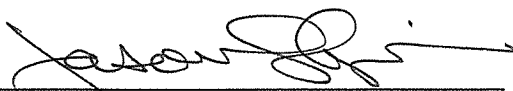
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections, and that they be withdrawn.

Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. The Director is authorized to charge any fees or overpayment to Deposit Account No. 02-2135.

Respectfully submitted,

By: _____



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